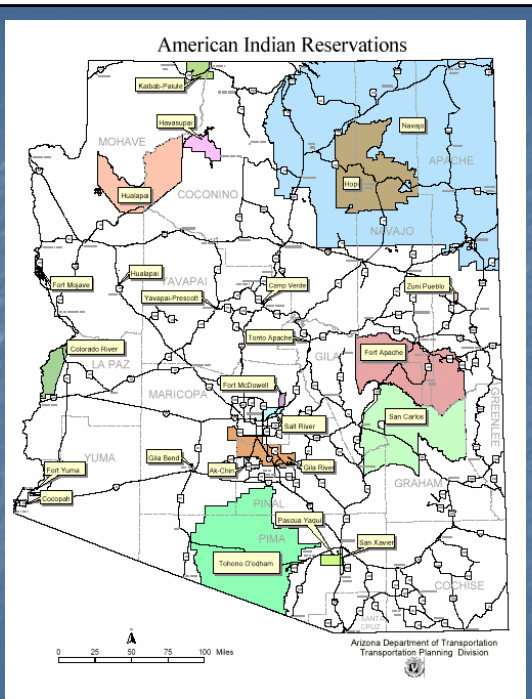
Salt River Pima-Maricopa Indian Community

NPS Demonstration Treatment Wetland Project

"Cottonwood Wetland"



319(h) Activities

- Clean Water Act (1987) established Section 319 NPS Management Program
- Grant money available to States, Territories, and Tribes for a variety of activities:
  - Technical & financial assistance
  - Education & Training
  - Technology transfer
  - Demonstration projects
  - Monitoring

NPS pollution on the SRPMIC

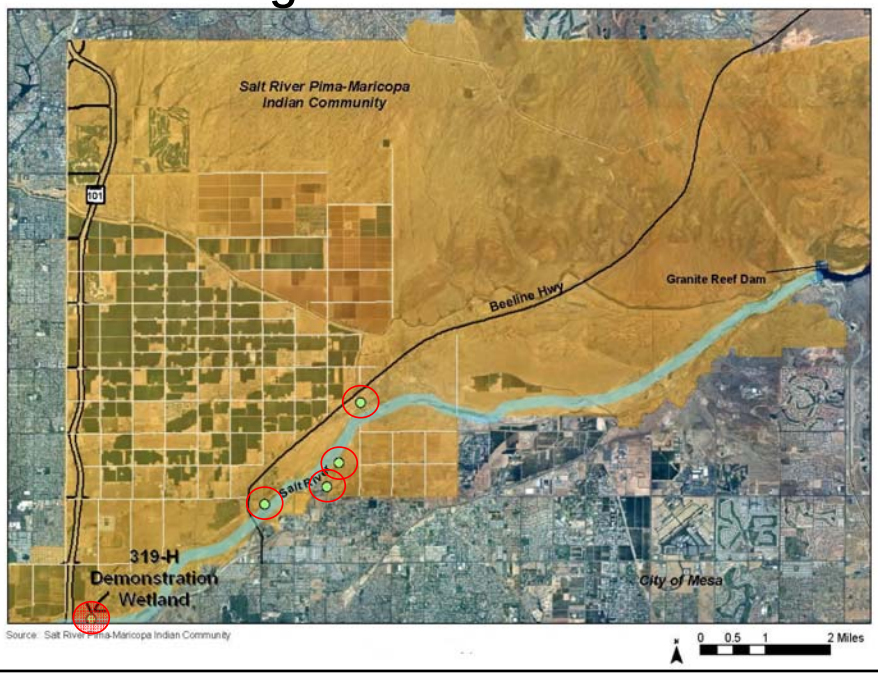
Caused by rainfall and agricultural flows over land →

- Water picks up pollutants, such as...
  - Soil and dust particles
  - Nutrients
  - Grease, oils & metals
  - Trash & debris
  - Bacteria
  - Pesticides

2000 – Grant Received

- Community investigated sources of NPS pollution
  - Agricultural tailwater outfalls to the Salt River

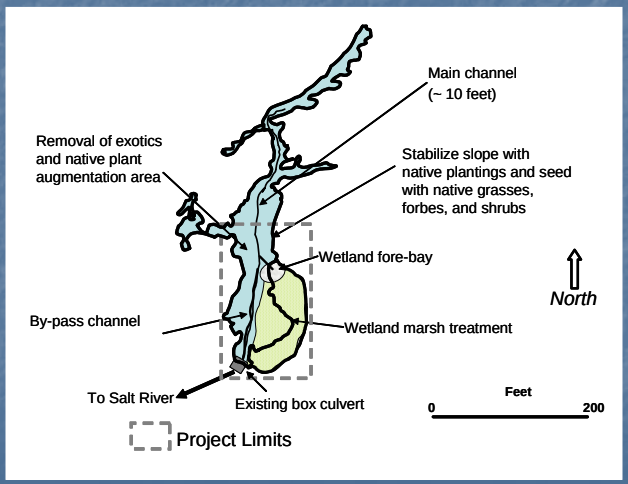
Investigated Potential Outfalls



2003 - Construction

- BEFORE: unlined channel dominated by tamarisk
- Carries NPS flows from agricultural tail water, mining wash, and stormwater

Original Layout



Current Layout

Ecosystem Restoration Opportunity

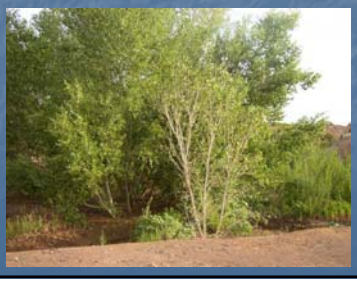
- Removal of exotic and invasive tamarisk
- Bobcat
- Chainsaws
- Herbicides
- WEEDING

Channel Stabilization

- Rocks
- Vegetation
- Manufactured solutions available

Native Vegetation

Wetland was planted with a variety of aquatic and terrestrial plants



Pole Planting Method

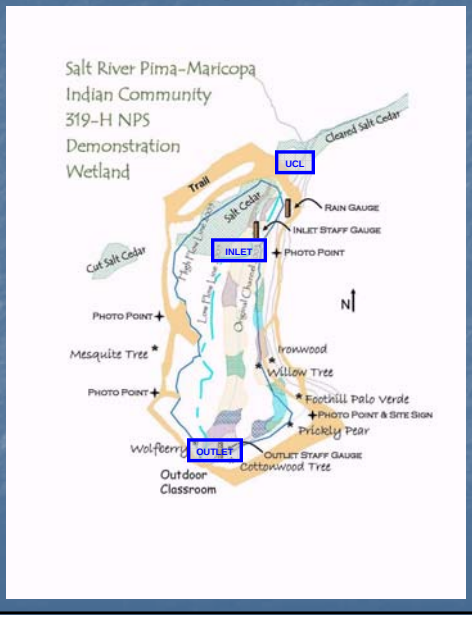
Native Vegetation

Surrounding uplands planted with terrestrial mixture of mesquite, palo verde, cactus and xeric shrubs

Monitoring Plan

- Quality Assurance Project Plan (QAPP)
  - Data-collection objectives of the wetland
  - Developed & submitted to EPA in 2003/2005
  - Approved by EPA in 2005
- Weekly
- Monthly
- laboratory samples

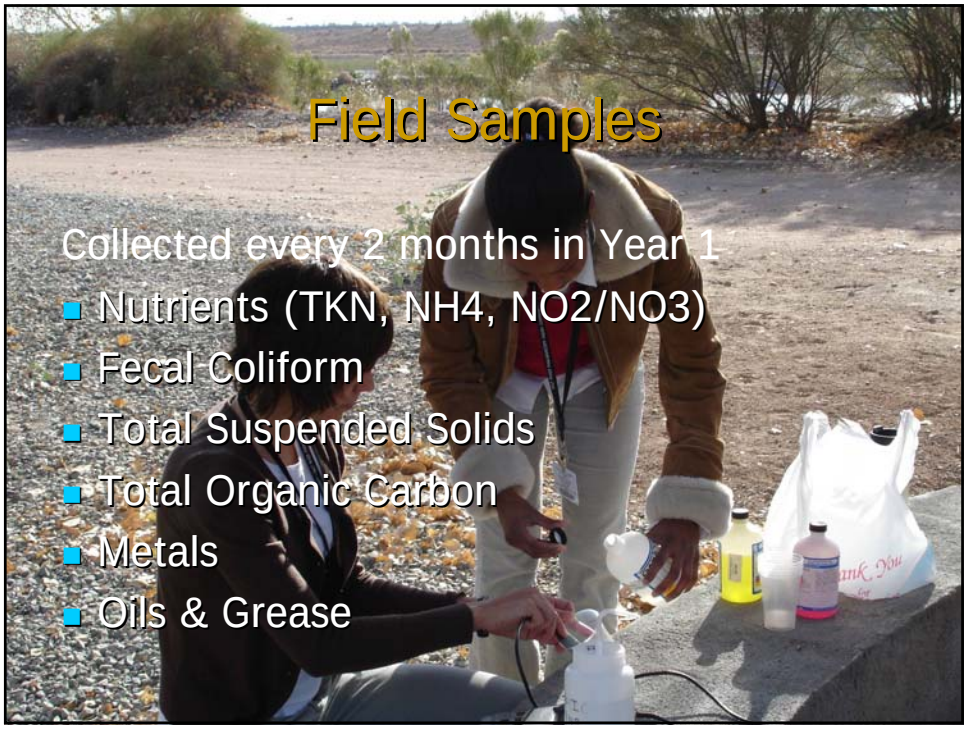
Three Sampling Points



Field Measurements

Taken every week during Year 1; every month thereafter

- pH
- temperature
- dissolved oxygen
- electrical conductivity
- turbidity
- flow



Important Files

- Field Log Data Sheets
- Reports
- Analytical Analyses

- Hard copies
- E-copies

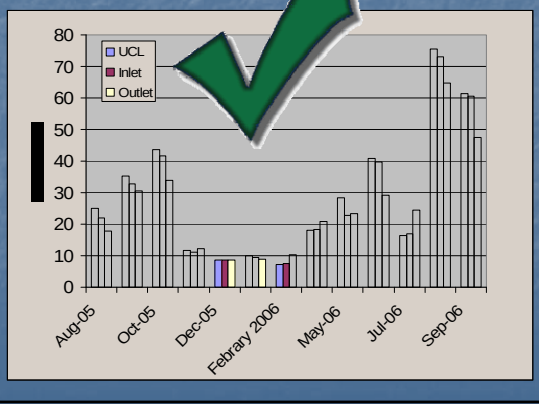
- Photos (labeled)

Water Quality Changes

- Reduced turbidity
- Increased accumulation of sediment
- Other parameters within water quality standards

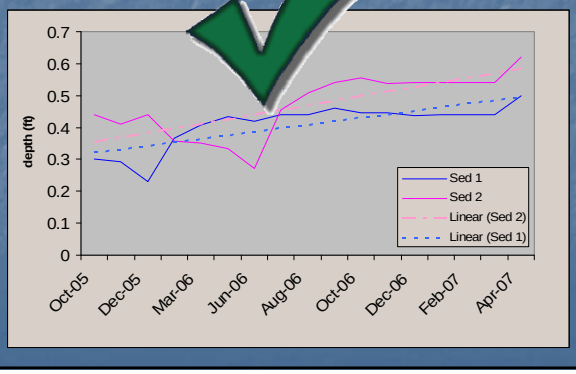
Turbidity

- Overall: reduced as water flows through wetland
- FY2006 annual average was ~3% removal but the outlet values exceeded 50 NTU only during 1 storm event



Sediment Trapping

- Gauges indicate a slow accumulation of height
- Average annual accumulation to date ~ 2.28” or 0.2’



Total Suspended Solids (TSS)

- Fluctuation, but began to be reduced as wetland vegetation matured (2006)

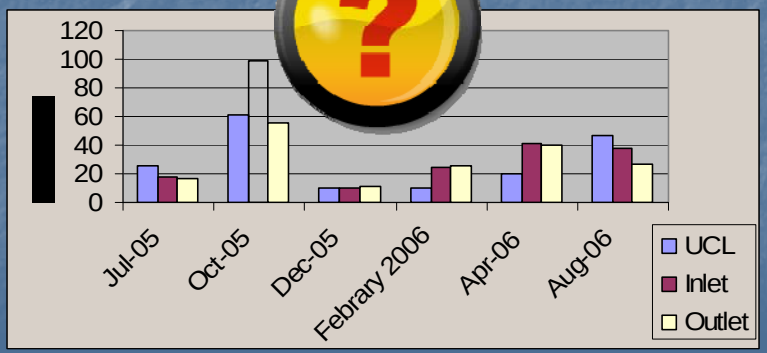


Photo Points

Other Parameters

- pH varies between 7.5 and 8.8
- DO usually decreases as it passes through the wetland – between 3 and 9 ppm
- Conductivity consistent among sites – varies with the temperature
- Flow reduced as it passes through, especially during summer months (ET)

Wetland Reconfiguration – Fall 2005

Benefits to Wetland

- Increased visitation
- Enhanced aesthetics
- Improved safety
- Solid waste issue addressed
- “Ownership” of project

Expansion Project – May 2007

Salt River Pima-Maricopa Indian Community

Cottonwood Wetland

Expansion

- Salt Cedar Removal & Native Plant Establishment

- Delivery Channel Clean-Up & Native Plant Establishment

Area I:	Area II:
Clear and grub approximately 0.45 acre of existing salt cedar. Replant w/Coyote Willow, Gooding's Willow, and Freemont Cottonwood	Weed and prepare approximately 200 LF existing channel. Replant w/Coyote Willow, Gooding's Willow, and Freemont Cottonwood

Expansion Project – May 2007

Benefits to Wetland

- Increased treatment area
- Exotic and invasive species removed

Lessons Learned

- Increased publicity = increased vandalism
- Partnerships important
- Long-term maintenance plan
- Routines a *must*
- Sinkholes
- Water goes where it wants to!

Overall Benefits to the Salt River

- Reduces pollutant loading to the river channel by providing:
  - water quality treatment
  - erosion control

Overall Benefits to the Community

- Create wildlife habitat
- Attractive Community amenity
- Recreational opportunity
- Educational opportunity


Salt River Pima-Maricopa Indian Community BIA-II NPS Demonstration Wetland
SRPMIC Demonstration Wetland Project
Prickly pear
Opuntia engelmannii
Ebhai

Awards

- EPA Environmental Achievement Award May of 2005
- Arizona Water Pollution Control Association “Water Reuse Project of the Year” 2006

The Future

- Continued water quality monitoring
- Community education and outreach
  - Schools
  - Plantings
  - Cultural resources
- Expansion of treatment wetlands on the Community
  - Proposal for the Lehi district